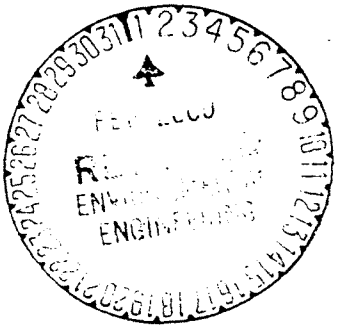
MONTANA-DAKOTA
UTILITIES CO.
A Division of MDU Resources Group, Inc.

400 North Fourth Street
Bismarck, ND 58501
(701) 222-7900

January 31, 2000

Mr. Jeff Burgess, P.E.
Director, Division of Environmental Engineering
North Dakota Department of Health
1200 Missouri Avenue, Room 304
P.O. Box 5520
Bismarck, ND 58506-5520



Re: 1999 Annual Emissions Inventory

Dear Mr. Burgess:

Enclosed you will find the 1999 Annual Emission Inventories for Heskett Units 1 and 2, and the Williston Turbines. I have also included the Hazardous Air Pollutant Annual Emission Inventory Report for Heskett Station.

If you have any questions or need additional information, please don't hesitate to contact me at (701) 222-7689.

Sincerely,

Rick Patzman

Rick Patzman
Senior Environmental Scientist

Enclosures:

cc: Gary Gress, Office
Andrea Stomberg, Office
Alan Welte, Heskett Station
Gary Flakker, Glendive Turbine

File: Air/Emissions Inventory

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FUEL BURNING EQUIPMENT USED FOR INDIRECT HEATING
ANNUAL EMISSION INVENTORY REPORT
NORTH DAKOTA DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL ENGINEERING
SFN 8536 (8-95) (AP-301)

GENERAL

Name of Firm or Organization			Year of Emissions
Montana-Dakota Utilities Co.			1999
Mailing Address	**City**	**State**	**Zip Code**
400 North Fourth Street	Bismarck	ND	58501
Facility Location	**Permit to Operate Number**	**Source Unit Number**	
Mandan, ND	F76001	Heskett Unit 1	

EQUIPMENT INFORMATION

Manufacturer of Unit	Model Number	Maximum Heat Input (BTU/hr)
Riley Stoker		387 X 10^6
Boiler Type: ☐ Pulverized Tangential ☐ Cyclone ☒ Spreader Stoker ☐ Pulverized Wall Fired ☐ Fluidized Bed ☐ Other Stoker		**Hours of Operation (hrs/yr)** 7631 Hours

FUELS USED

Type (ex. lignite, natural gas, LPG, No. 2 fuel oil, No. 6 fuel oil, etc.)		Primary Fuel	Standby Fuel	Other Fuel
		Lignite	Contaminated Subbituminous	
Quantity of Fuel per Year (Specify Units: ex. (ton), gal, cu.ft. etc.)		88,842	375	
Percent Ash (Coal Only)	Maximum	8.99	31.56	
	Minimum	5.53	21.23	
	Average	6.59	26.65	
Percent Sulfur	Maximum	2.48	0.69	
	Minimum	0.39	0.25	
	Average	0.72	0.42	
BTU per Unit (Specify lb, ton, gal, etc.)	Maximum	7274	7987	
	Minimum	6838	5103	
	Average	7072	6422	
Percent Sodium in Lignite Ash	Average	----------	----------	

TOTAL STACK EMISSIONS

(USE THIS CHART FOR SINGLE FUEL USAGE. USE OTHER SIDE IF MULTIPLE FUELS ARE USED AND SUMMARIZE THE TOTAL TONS PER YEAR ON THIS CHART.)

Air Contaminant *	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons per Year
Particulate - Total	----------	----------	14.43
PM10 (Particulate < 10 microns)	----------	----------	12.99
Sulfur Dioxide	----------	----------	813.50
Nitrogen Oxides	----------	----------	~~251.3~~ ~~260.21~~
Carbon Monoxide	----------	----------	223.04
Total Organic Compounds: Nonmethane	----------	----------	2.23

* Submit SFN 19839 for Hazardous Air Pollutants if applicable.

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report	Title	
Richard A. Patzman	Senior Environmental Scientist	
Signature	**Telephone Number**	**Date**
Richard A. Patzman	(701) 222-7689	1/31/00

Return completed form to:

NORTH DAKOTA DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL ENGINEERING
Box 5520
Bismarck, ND 58506-5520
(701) 328-5188

STACK EMISSIONS *** PRIMARY FUEL *** FUEL TYPE: Lignite

Air Contaminant *	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons per Year
Particulate - Total	46% of Ash	Collection Efficiency of 99%	14.20
PM10 (Particulate < 10 microns)	90% pf Partic.	NDDOH Recommendation	12.78
Sulfur Dioxide	----------	CEMS Mass Emissions	813.50
Nitrogen Oxides	5.8 lbs/Ton	AP-42 (Table 1.7-1)	257.64
Carbon Monoxide	5.0 lbs/Ton	AP-42 (Table 1.1-3)	222.11
Total Organic Compounds: Nonmethane	0.05 lbs/Ton	AP-42 (Table 1.1-18)	2.22

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STACK EMISSIONS *** STANDBY FUEL *** FUEL TYPE: Contaminated Subbituminous

Air Contaminant *	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons per Year
Particulate - Total	46% of Ash	Collection Efficiency of 99%	0.23
PM10 (Particulate < 10 microns)	90% of Partic.	NDDOH Recommendation	0.21
Sulfur Dioxide	----------	Cems Mass Emissions	Included Above
Nitrogen Oxides	~~5.8~~ 5.3 lbs/Ton	AP-42 (Table ~~1.7-1~~ 1.1-3) (9/98)	~~2.57~~ 1.63
Carbon Monoxide	5.0 lbs/Ton	AP-42 (Table 1.1-3)	0.94
Total Organic Compounds: Nonmethane	0.05 lbs/Ton	AP-42 (Table 1.1-18)	0.01

* Submit SFN 19839 for Hazardous Air Pollutants if applicable.

STACK EMISSIONS *** OTHER FUEL *** FUEL TYPE:

Air Contaminant *	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons per Year
Particulate - Total			
PM10 (Particulate < 10 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			

* Submit SFN 19839 for Hazardous Air Pollutants if applicable.

Provide calculations for quantities listed above. Use additional sheets if necessary.

See attached worksheet

1999
HESKETT STATION UNIT #1 ANNUAL EMISSION INVENTORY WORK SHEET

Hours of Operation		7,631	Hours	
Quantity of Fuel	Lignite	88,842	Tons	
	Subbituminous	375	Tons	Total Fuel
	Tire Derived Fuel (TDF)	0	Tons	89,217 Tons/yr.
Average Heating Value	Lignite	7,072	BTU\lb	
	Subbituminous	6,422	BTU\lb	
	Tire Derived Fuel (TDF)	0	BTU\lb	
Ash Concentration in Coal	Lignite	6.95	Percent	
	Subbituminous	26.65	Percent	
	Tire Derived Fuel (TDF)	0	Percent	
Sulfur Dioxide Emissions (CEMS)		813.5	Tons/yr.	

Particulate		Lignite	Sub-Bit.	TDF	Total	
(Tons Coal x %Ash x Fly Ash(46%)x Coll.Eff.(1-99.5))	=	14.20	0.23	0.00	14.43	Tons/yr.
PM10 **						
Tons per Year x 90.0%	=	12.78	0.21	0.00	12.99	Tons/yr.
SO2 *						
Total tons emitted as determined by CEMS	=	———	———		813.50	Tons/yr.
NOx *						
(Tons Coal x ~~5.8~~ 8.8 lbs[~~13.7~~lbs]/Ton)/2000	=	257.64	~~2.57~~ 1.65		~~260.21~~ 259.29	Tons/yr.
CO *						
(Tons of Coal x 5.0 lbs/T)/2000	=	222.11	0.94		223.04	Tons/yr.
HC(nm) *						
Tons of Coal x Emission Rate (0.05 lbs/T)	=	2.22	0.01		2.23	Tons/yr.
HCl ((3350 X ((Tons Coal X 2000 X Btu) / 1X10 -12)) / 2000)	=	2.10	0.01		2.11	Tons/yr.
(Tons/yr. X 2000) / Hours of Operation	=	0.55	0.00		0.55	lbs/Hour
HF ((3980 X ((Tons Coal X 2000 X Btu) / 1X10 -12)) / 2000)	=	2.50	0.01		2.51	Tons/yr.
(Tons/yr. X 2000) / Hours of Operation	=	0.66	0.00		0.66	lbs/Hour

* Per AP-42 Method (9/88)

** Per Gary Helbling - NDSDH & CL - 2/28/90